

REMARKS

Claims 1 and 2-20 were rejected under 35 USC 112, second paragraph. This rejection is respectfully traversed and should be withdrawn in light of this Amendment.

Claims 22-24 were rejected under 35 USC 101. This rejection is moot as these claims have been canceled.

Claims 21-30 were rejected as being obvious over Thompson. This rejection is respectfully traversed.

It has been proven that in the process according to the present invention use of Group I metal azides is beneficial in various aspects, preferably when the molar ratio of Group I metal azides to ammonia ranges from 1:200 to 1:2.

The Group I metal aides of very high purity in a solid form are available commercially. Moreover, they can be easily purified by consecutive dissolving (e.g. in water or ammonia) and recrystallization from the solution. Once purified, the azides retain high purity for a relatively long time, as they are non-reactive and almost non-hygroscopic, thus they do not absorb impurities from air. Contrary to metallic lithium, sodium or potassium, the azides may be stored, manipulated and (in particular) put into an autoclave without special precautionary measures or equipment (e.g. a glove box).

Group 1 metal azides dissolve in supercritical ammonia-containing solution and dissociate into N_3^- and metal ions. The research studies directed to the use of azide mineralizers in processes according to the present invention revealed that under the present process conditions the azide ammonia solution is chemically stable up to ca. 250°C and is hardly reactive with respect to feedstock. It means that at the temperature below 250°C Group I metal azide does not act as the ammonobasic mineralizer. However, when the temperature of the supercritical ammonia-containing solution goes beyond 300°C, rapid decomposition of azide ion N_3^- takes place and molecular nitrogen N_2 is released. At this stage, azide acts as mineralizer and enhances dissolution of the feedstock and crystallization of gallium-containing nitride on the seed. Thus, if the second variant of the process according to the present invention is realized with metallic gallium as the feedstock, the use of azides makes it easier to control super-saturation and the amount of gallium that does not dissolve.

The main advantage of the present process according to the invention is that in the product obtained by the process certain uncontrolled impurities can be eliminated. Among such impurities are those introduced to the reaction solution with starting materials, the most troublesome being hygroscopic reagents bringing in oxygen in the form of absorbed water. Significant degree of elimination of oxygen from the bulk nitride monocrystals obtainable by the process according to the present invention has been possible. Such bulk nitride monocrystals are particularly desired when n-type electrically conductive layers are to be produced by using Si dopants.

If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no.

204552034000. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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Respectfully submitted,

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